Biology:

**Nervous System**: combination of cells whose function is to allow an organism to gain information about what is going on inside and outside the body

**Neuron**s: cells that are specialized to rapidly respond to signals and quickly send signals

**Glial Cells**: hold neurons together and helps communicate with one another

**Parts of a Neuron:**

**Axon:** carries signals from the body of a neuron out to where communication occurs

**Dendrite**: receives signals from the axon and carries those signals to the cell body

**Cell Body**: connects dendrites, contains nucleus

**Synapse:** gap between neurons which they communicate

**Communication Between Neurons:**

**Neurotransmitters:** chemical that assists in the transferof signals from one neuron to

Another

**Receptors**: proteins that neurotransmitters attach to

**Parts of Action Potential**:

**Action Potential**: abrupt wave of electrochemical changes in the axon

**Myelin Sheath:** fatty substance that wraps around axons and increases speed of action

Potentials

**Refractory Period**: short rest period between action potentials

**Different Nervous Systems:**

**Peripheral Nervous System:** carries out sensory and motor functions

**Central Nervous System:** controls activities of the body

**Somatic Nervous System:** transmits information from the senses to the central

Nervous system and carries signals to the muscles

**Autonomic Nervous System:** carries messages between CNS and the organs of the

Body

**Parasympathetic Nervous System:** conserves energy, lowers heartbeat and blood sugar

**Neurotransmitters:**

**Acetylcholine:** memory processes and movement

**Norepinephrine:** arousal, mood, learning

**Serotonin:** mood, attention, appetite

**Dopamine:** movement and higher cognitive activities

**GABA:** anxiety

**Glutamate:** learning and memory

**Endorphins:** pain pathways

Parts of the Brain:

**Forebrain**

**Thalamus:** Relays sensory signals, motor signals, regulates consciousness, sleep, and alertness.

**Hypothalamus:** Regulates homeostasis and controls the pituitary gland.

**Amygdala:** Responsible for emotions, survival instincts, and memory.

**Hippocampus:** The hippocampus is highly involved in memory.

**Limbic System:** Generally regulates basic emotions such as fear and rage.

**Hindbrain**

**Pons:** Consists of nerve fibers that connect the cerebrum and the cerebellum.

**Medulla:** Responsible for automatic functions and reflexes.

**Cerebellum:** Responsible for motor functions as well as balance.

**Lobes of the Brain**

**Frontal Lobe:** involved in speaking and muscle movements and in making plans and judgments

**Parietal Lobe:** Responsible for integrating sensory information from different parts of the body, especially visual information related to navigation and spatial orientation.

**Somatosensory Cortex:** This cortex is a system of nerves that respond to stimuli or changes to different areas of the body.

**Optical Lobe:** Is the primary visual cortex and the central area for visual processing, visual perception, and color recognition.

**Temporal Lobe:** The primary function of the temporal lobe is processing auditory sensory input

**Neuroimaging Techniques:**

**Electroencephalogram(EEG):** recording of the waves of electrical activity that sweep across the brain’s surfaces, measured in electrodes

**CT Scan:** series of x-ray photographs taken from different angles that can reveal brain damage

**PET Scan:** visual display of brain activity that detects where a radioactive form of glucose goes while the brain is performing a task

**MRI:** technique that uses magnetic fields and radio waves to produce images that distinguish among different types of soft tissue, allows us to see structures within the brain